



GUJARAT TECHNOLOGICAL UNIVERSITY

Program Name: Minor/Hons. Degree

Level: UG

Branch: Minor/Hons. Next Generation Smart Village Subject Code: Subject

Code: BE050AD011

Subject Name: Smart Village Surveys

w. e. f. Academic Year:	2026-27
Semester:	5
Category of the Course:	Core Courses

Prerequisite:	Basic Concept of Smart Village
Rationale:	To develop basic understanding about various surveys to be carried out for gap analysis in terms of infrastructural requirements and Socio- economic.

Course Outcomes:

After Completion of the Course, Student will able to:

Sr. No.	CO statement	Marks% weightage
CO-1	Students will be able to demonstrate and carry out surveys related to various Socio-Economic domains; Environmental domains, public services, surveillance and safety domains.	25
CO-2	Students will be able to understand and apply various computing architectures for collecting various data	50
CO-3	Students will be able to identify and demonstrate various challenges to be addressed for developing smart villages	25

Teaching and Examination Scheme:

Teaching / Learning Scheme (in Hours per semester)					Total Credits = TH/30	Assessment Pattern and Marks					Total Marks
L	T	P	TW/ SL (PBL*)	TH		Theory		Tutorial / Practical			
						ESE (E)	PA (M)	PA (I)	PBL (I)	ESE (V)	
45	0	30	45	120	04	70	0	0	30	50	150

***Problem Based Learning (PBL) aims to accommodate learning beyond syllabus as per clause 9.4 of NBA manual.**

Where L = Lecture, T= Tutorial, P= Practical, TW/SL = Term-Work / Self-Learning with PBL, TH = Total Hours, PA = Progressive Assessment, ESE = End-Semester Examination.



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Content:

Sr. No.	Content	Total Hrs
1	Introduction: Need and Objective of Surveys, Domains and Dimensions of Inquiries, preparation of survey and interview forms Pre-Execution of Survey: Planning and scheduling surveys, Sampling Plans, Trainings to staff.	03
2	Land Survey & Measurements: Use of tapes, Sensors, Compass, GPS and EDM for measurement, Infrastructure measurements and collection of land records, Housing Survey, Aerial Photography, Geo informatics.	08
3	Socio-Economic Survey: Education and Entrepreneurship, Healthcare and life enrichment, Availability of Internet Connectivity, Tourism and Entertainment, Agriculture and Enterprises, Logistic and Public Transport, Skill Development Programs, Smart Banking Technology.	08
4	Environmental Survey: Building and Housing, Sources of Drinking water & its distribution pattern, Water Conservation, Energy and Smart Grids. Pollution control and Waste Management, Sanitation and cleanliness, Public Places with Green Zones, Feasibility of Gobar Gas and Bio-Gas Plants.	08
5	Public Services Survey: Interaction with Stakeholders for Public Infrastructures and GAP analysis, Urban Apps and Open platform using ICTs.	08
6	Surveillance, safety and General Awareness: Monitoring, Managing and Regulating Village Flows and Processes, Public Safety and Emergency Response, Participation in policy making, Awareness for Government Schemes and Disasters, E-governance.	07
TOTAL		42

Suggested Specification table with Marks (Theory):

Distribution of Theory Marks					
R Level	U Level	A Level	N Level	E Level	C Level
10%	25%	20%	20%	15%	10%

R: Remembrance; U: Understanding; A: Application, N: Analyse and E: Evaluate C: Create and above Levels (Revised Bloom's Taxonomy)



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Reference Books:

1. International Handbook of Survey Methodology edited by Edith D. de Leeuw, Joop Hox, DonDillman, Lawrence Erlbaum Associates Inc, Taylor and Francis Group
2. How to Create Smart Villages: Open Innovation Solutions for Emerging Markets By SolomonDarwin, Werner Fischer, Henry Chesbrough, Peaceful Evolution Publishing
3. Development Programme 2020-21, Government of Gujarat, General Administration Department Planning Division Sachivalaya, Gandhinagar.
4. <https://planning.gujarat.gov.in/images/pdf/DP-Eng-20-21.pdf>

List of Tutorials:

1. **Smart Village Framework and Survey Design**
Indicators, domains, survey objectives, and preparation of questionnaires and interview schedules.
2. **Survey Planning, Sampling, and Ethics**
Sampling techniques, survey scheduling, enumerator training, and ethical considerations.
3. **Land, Housing, and Infrastructure Survey Techniques**
Measurement tools, housing condition assessment, and infrastructure data collection.
4. **Geoinformatics and Village Mapping**
GPS basics, Google Earth / GIS tools, thematic mapping, and aerial data interpretation.
5. **Socio-Economic and Environmental Survey Methods**
Education, health, livelihoods, water, energy, waste, sanitation, and green spaces.
6. **Public Services Assessment, ICT Tools, and Smart Village Planning**
GAP analysis, e-governance platforms, safety and disaster preparedness, and mini DPR preparation.

List of Open-Source Software/learning website:

1. **QGIS** – Open-source GIS software for village mapping, land use analysis, and the matic map preparation.
Website: <https://qgis.org>
2. **Google Earth & Google My Maps** – Satellite imagery, village visualization, and basic spatial mapping.
Website: <https://earth.google.com>
Website: <https://www.google.com/mymaps>
3. **Census of India & Open Government Data (OGD) Platform** – Demographic, socio-economic, and infrastructure datasets.
Website: <https://censusindia.gov.in>
Website: <https://data.gov.in>
4. **SWAYAM / NPTEL** – Free online courses and learning resources on surveying, GIS, environment, and rural development.



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Website: <https://swayam.gov.in>

Website: <https://nptel.ac.in>

5. **National Remote Sensing Centre (Bhuvan Portal)** – Indian satellite data, village-level maps, and geospatial services.

Website: <https://bhuvan.nrsc.gov.in>

List of suggested activities for Problem Based Learning:

Sr. No.	Name of the Activity	No. of Hours	Evaluation Criteria
1	Village Profiling, Baseline Data Collection & Survey Tool Design	7	Completeness of village profile, relevance and quality of survey tools
2	Survey Planning, Sampling Design & Enumerator Training	5	Appropriateness of sampling plan, feasibility of execution strategy
3	Land Survey, Infrastructure Measurement & Housing Assessment	7	Accuracy of measurements, quality of sketches/maps, data consistency
4	Geo-spatial Mapping & Aerial Data Interpretation	5	Correct use of mapping tools, thematic clarity, spatial accuracy
5	Socio-Economic Survey & Livelihood / Entrepreneurship Assessment	7	Data quality, sectoral analysis, identification of gaps and opportunities
6	Environmental Survey (Water, Energy, Waste, Sanitation & Green Spaces)	7	Environmental indicators used, practicality of sustainability measures
7	Public Services Assessment, GAP Analysis (Village's current state (what is) with its desired future state (what should be) & ICT / E-Governance Review	4	Logical GAP analysis, relevance of ICT solutions to village needs
8	Safety, Disaster Preparedness & Government Scheme Awareness	3	Risk identification, awareness assessment, mitigation strategies
9	Integrated Smart Village Survey Report (Mini DPR) & Presentation	5	Integration of data, innovation in solutions, report quality and presentation
